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Translation

PCT/DE2003/004037

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002P20155WO	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/DE2003/004037	International filing date (*day/month/year*) 08 December 2003 (08.12.2003)	Priority date (*day/month/year*) 20 December 2002 (20.12.2002)
International Patent Classification (IPC) or national classification and IPC H02K 17/16		
Applicant SIEMENS AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand 14 May 2004 (14.05.2004)	Date of completion of this report 23 May 2005 (23.05.2005)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/DE2003/004037

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-5, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☒ the claims:

pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages 1-16, filed with the letter of 15 December 2004 (15.12.2004)

☒ the drawings:

pages 1/1, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/DE 03/04037

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-16	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-16	NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims		NO

2. Citations and explanations

1.

In this report, reference is additionally made to the following search report citation (D):

D6: US 5 530 310.

2.

Claim 1 does not satisfy the requirements of PCT Article 6, since the amendments made are not clear: "the stranded conductors being arranged **in a ladder-shaped** and **matingly shaped manner** in the grooves".

It is not clear what is meant by "matingly shaped".

In the letter of 15 December 2004 the applicant justified the amendments to the first claim, which involve the incorporation of *inter alia* claim 3, where the following phrase appears:
"**in a meandering manner** and **contradirectionally**".

The examiner assumes that this amendment contains errors of transcription, since the original adverbs and amended adverbs are similar words in German. The further examination is conducted on the basis of the phrase "**in a meandering manner** and **contradirectionally**".

3.
The subject matter of independent claim 1 does not involve an inventive step (PCT Article 33(3)).

D1 discloses (the references in parentheses relate to said document):
an electrical machine with a squirrel-cage rotor, which has a squirrel-cage winding consisting of flexible conductors (see first written opinion of 28 September 2004),
the flexible conductors being stranded conductors (see first written opinion, third paragraph; also: fig. 7. The conductor 71A is hatched, so evidently consists of strands).

The subject matter of claim 1 differs from the subject matter of D1 in that the stranded conductors are arranged in a meandering manner and contradirectionally in the grooves of the squirrel-cage rotor in order thereby to establish a short-circuit connection in the rotor.

The problem addressed by the present invention can therefore be considered that of establishing a more reliable short-circuit connection of conductors in adjacent grooves (shorter current paths).

The distinguishing features have, however, already been used in a similar electrical machine, cf. D6:
Fig. 4 describes "rods" (2), each of which is disposed, even if not meanderingly (that is to say, continuously), then at least **in a** meandering **manner** in a groove of the squirrel-cage rotor. If the rods are traced along a path as it were, then the paths in adjacent grooves are contradirectional (as is usual in the case of a meander

shape). Claim 1 does not state that two rods have to extend contradirectionally inside **one groove**.

A short-circuit connection is established **in the** rotor in D6, since the rotor also consists of the rotating parts referred to as "rods" and a short-circuit ring (4) which is electrically connected thereto. The description in the present application (page 3, lines 12 ff.) mentions, with reference to fig. 1, a squirrel-cage rotor in **unwound** form with a winding as shown in fig 1; in other words, here too the winding is part of the rotor.

A person skilled in the art could easily apply these features to the subject matter of D1 to like effect. In this way he would arrive at an electrical machine as per claim 1 without thereby being inventive. The subject matter of claim 1 does not therefore involve an inventive step (PCT Article 33(3)).

4.
The dependent claims are likewise considered to be non-inventive.

5.
The examiner considers the following combination of features to be novel and inventive: the flexible conductors extend **meanderingly** and in grooves. In **one** groove of the squirrel-cage rotor there are disposed two contradirectional conductors in order thereby to establish the short-circuit connection in the **groove**.

The examiner considers that the incorporation of these features in the main claim is also essential for the solution of the problem referred to in the description (avoidance of fatigue failure).